APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,748	12/30/2003	Jongmo Sung	2013P145	9057

8791   7590   04/25/2008
BLAKELY SOKOLOFF TAYLOR & ZAFMAN
1279 OAKMEAD PARKWAY
SUNNYVALE, CA 94085-4040

EXAMINER
WOZNIAK, JAMES S

ART UNIT	PAPER NUMBER
2626	

MAIL DATE	DELIVERY MODE
04/25/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
	10/749,748	SUNG ET AL.
Office Action Summary	Examiner	Art Unit	
	JAMES S. WOZNIAK	2626	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

    A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>01 February 2008</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-4 and 6-13</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-4 and 6-10</u> is/are rejected.

7)☒ Claim(s) <u>11-13</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>01 February 2008</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some *   c)☐ None of:

        1.☒ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   In response to the office action from 9/28/2007, the applicant has submitted an
amendment, filed 2/1/2008, amending independent claims 1, 4, and 8, while arguing to traverse
the art rejection based on the transcoder comprising a transcoding filter and a transcoding filter
design unit *(Amendment, Pages 9-10)*. Applicant's arguments have been fully considered,
however the previous rejection is maintained due to the reasons listed below in the response to
arguments.

2.   In response to the amendments to Figs. 1 and 2, the examiner has withdrawn the previous
drawing objections.

3.   In response to the amended claims, the examiner has withdrawn the previous objection
directed towards minor informalities.

4.   The applicant argues that amended claim 8 overcomes the previous 35 U.S.C. 101
rejection because it adds processing related to providing a useful, concrete, and tangible result.
In response, the examiner notes that this rejection is maintained because the added limitation is
directed to an intended use of the transcoding filter and not active filtering and encoding steps
that would generate the "useful, concrete, and tangible result".

Response to Arguments

5.   Applicant's arguments have been fully considered but they are not persuasive for the

following reasons:

        With respect to **Claims 1, 4, and 8**, the applicant argues that Jabri et al *(U.S. PG*

Publication: 2004/0158463) fails to teach a transcoding filter design unit and a transcoding filter

that are part of a transcoder because Jabri requires a voice quality perceptual test for determining

weighting factors *(Amendment, Pages 9-10)*.

        In response, the examiner notes that the weighting filter processing means taught by Jabri

for weighting filter development is part of the overall transcoding system *(i.e., transcoder) (Fig.*

7 and Paragraphs 0030 and 0035-0036), which also features a weighting filter that uses the

optimized weighting parameters *(Fig. 7)*.   Also, while the optimization can occur using test

samples *(Fig. 12)*, such processing can be alternatively performed.   For example, the parameters

can be adjusted automatically in the transcoder for weighting filter design *(Paragraph 0036)*.

Regardless of the selected process, however, these optimizations would anticipate the claimed

invention because the filter optimizer and perceptual weighting filter are included in the

transcoding system.   Thus, the applicant's arguments have been fully considered, but are not

convincing.

        In addition, independent claims 4 and 8 are directed to method claims that do not require

the specific structure of a transcoder having a design unit and a filter unit, thus, the applicant's

arguments do not apply to these claims.

The art rejection of the remaining independent claims is traversed for reasons similar to

the independent claims *(Amendment, Pages 10-11)*. In regards to such arguments, see the

response directed towards claim 1.

Claim Rejections - 35 USC § 112

6.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

   The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
   subject matter which the applicant regards as his invention.

7.   **Claims 4 and 6-7** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite

for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention.

       Claim 4 contains sub-steps A1 and A2 that also appear to be performed after step A,

however, steps A1 and A2 both result in a generated transcoding filter, and thus, it is unclear

whether steps A1 and A2 occur subsequent to step A or if steps A1 and A2 comprise step A.

Looking to previous claim 5, it appears that the claim should state --minimizing a spectral

distortion is applied *by*:-- followed by steps A1-2. The claim language will be considered as

such for the application of the prior art of record. The dependent claims fail to overcome the

above rejection, and thus, are also rejected under 35 U.S.C. 112, second paragraph by virtue of

their dependency.

Claim Rejections - 35 USC § 101

8.   35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9.   **Claims 8-13** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 8 is directed to a process for generating a mathematical filter function for a transcoding filter by performing a series of abstract mathematical operations *(generating a reference filter based on abstract perceptual weighting and post-filter characteristics and calculating a weight that minimizes a spectral distortion factor)*. The final result in this process is an abstract transcoding filter equation, which is not a "useful, concrete, and tangible result". In order to be considered statutory, the claimed invention as a whole must be useful and accomplish a practical application. That is, it must produce a "useful, concrete and tangible result." State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02. Since the final result of claim 8 is only directed to the abstract transcoding filter equation *(i.e., transcoding filter)* and its associated intended use and not to an active step for filtering and encoding a real-world speech signal using the generated filter, claim 8 does not produce a "useful, concrete and tangible result", and thus, is directed to non-statutory subject matter. Claims 9-13 fail to overcome the non-statutory subject matter issues of independent claim 8, and thus, are also rejected under 35 U.S.C. 101.

Claim Rejections - 35 USC § 102

10.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11.   **Claims 1-4 and 8** are rejected under 35 U.S.C. 102(e) as being anticipated by Jabri et al

(U.S. Patent Application Publication: 2004/0158463).

With respect to **Claim 1**, Jabri discloses:

A decoding unit of an input CELP codec, which converts a bitstream encoded in an input

CELP codec format into a speech signal *(unpacking means used to generate a speech signal*

from a coded CELP input, Paragraph 0033);

A transcoding filter, which performs filtering of the speech signal decoded in the

decoding unit of the input CELP codec with filter characteristics calculated by adapting an

optimum weight to minimize spectral distortion on the basis of a reference filter *(weighting filter*

having a pair of weighting factors optimized for a highest voice quality (i.e., minimal distortion)

and with respect to source and destination codecs comprising filtering means, Paragraphs 0035-

0036, 0041; and 0005-0006);

A transcoding filter design unit, which extracts the optimum weight to minimize spectral

distortion of the transcoding filter from a weight set, and then supplies the optimum weight to the

transcoding filter *(determining the optimum pair of possible weighting factors that maximize*

voice quality or minimize distortion and utilizing such factors in a weighting filter, Paragraphs 0035-0036 and 0041); and

An encoding unit of an output CELP codec, which generates a bitstream in an output CELP codec format by encoding the speech signal filtered in the transcoding filter *(packing module that packs a destination codec bitstream, Paragraph 0030).*

With respect to **Claim 2**, Jabri discloses a more general form of the perceptual weighting equation that is well known in typical CELP coding and recited in claim 2 *(Paragraphs 0035-0036).* Jabri further discloses post-filtering used at a receiver in typical CELP decoding *(Paragraph 0005),* which would inherently include a well-known tilt compensation factor.

With respect to **Claim 3**, Jabri further discloses:

A procedure to generate the reference filter for evaluating the transcoding filter using characteristics of a perceptual weighting filter and post-filter of the input CELP codec and a perceptual weighting filter of the output CELP codec *(weighting filter having a pair of weighting factors optimized with respect to source and destination codecs comprising filtering means, Paragraphs 0035-0036, 0041, wherein the input CELP encoder comprises perceptual and synthesis filters and the output CELP decoder comprises a perceptual weighting filter, 0005-0006);* and

On the basis of the reference filter, a procedure to evaluate a transcoding filter weight as an optimum weight when spectral distortion is minimum *(determining the optimum pair of possible weighting factors that maximize voice quality or minimize distortion with respect to source and destination codecs comprising filtering means, Paragraphs 0035-0036 and 0041).*

With respect to **Claim 4**, Jabri discloses:

(A) Generating a transcoding filter, which has perceptual weighting filter characteristics, to which a weight minimizing a spectral distortion is applied *(determining the optimum pair of possible weighting factors that maximize voice quality or minimize distortion, Paragraphs 0035-0036 and 0041)*;

(A1) A procedure to generate the reference filter for evaluating the transcoding filter using characteristics of a perceptual weighting filter and post-filter of the input CELP codec and a perceptual weighting filter of the output CELP codec *(weighting filter having a pair of weighting factors optimized with respect to source and destination codecs comprising filtering means, Paragraphs 0035-0036, 0041, wherein the input CELP encoder comprises perceptual and synthesis filters and the output CELP decoder comprises a perceptual weighting filter, 0005-0006)*; and

(A2) On the basis of the reference filter, a procedure to evaluate a transcoding filter weight as an optimum weight when spectral distortion is minimum *(determining the optimum pair of possible weighting factors that maximize voice quality or minimize distortion with respect to source and destination codecs comprising filtering means, Paragraphs 0035-0036 and 0041)*.

(B) Converting a bitstream encoded in an input CELP codec format into a speech signal *(unpacking a speech signal from a coded CELP input, Paragraph 0033)*;

(C) Filtering a speech signal generated in step (B) with the transcoding filter generated in step (A) *(utilizing determined weighting factors in a weighting filter, Paragraphs 0035-0036 and 0041)*; and

(D) Generating a bitstream of an output CELP codec format by encoding the speech signal filtered in step (C) *(packing a destination codec bitstream, Paragraph 0030)*.

With respect to **Claim 8**, Jabri discloses:

A method of designing a transcoding filter of the transcoder which includes a decoding unit of an input CELP codec, which converts a bitstream encoded in an input CELP codec format into a speech signal (*unpacking means used to generate a speech signal of a source or input CELP codec, Paragraph 0033*), a transcoding filter which performs filtering of the converted speech signal with perceptual weighting filter characteristics (*perceptual weighting filter having weighting parameters, Paragraphs 0035-0036, 0041*), and an encoding unit of an output CELP codec, which generates a bitstream of an output CELP codec format by encoding the filtered speech signal (*packing module that packs bitstreams in a destination codec format, Paragraph 0030*), comprising:

(A) Generating a reference filter by using characteristics of a perceptual weighting filter and post-filter applied to the input CELP codec and of the perceptual weighting filter applied to the output CELP codec (*weighting filter having a pair of weighting factors optimized with respect to source and destination codecs comprising filtering means, Paragraphs 0035-0036, 0041, wherein the input CELP encoder comprises perceptual and synthesis filters and the output CELP decoder comprises a perceptual weighting filter, 0005-0006*);

(B) Selecting an optimum weight which minimizes a spectral distortion of the transcoding filter from a pre-selected weight set on the basis of the reference filter (*determining the optimum pair of possible weighting factors that maximize voice quality with respect to source and destination codecs, Paragraphs 0035-0036 and 0041*); and

(C) Generating the transcoding filter by applying the weight selected in step (B), the generated transcoding filter operating to filter the speech signal for processing by the encoding

unit *(utilizing selected weighting factors in a weighting filter, Paragraphs 0035-0036 and 0041;*

and optimized filter used with an encoder, Fig. 7).

Claim Rejections - 35 USC § 103

12.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

13.   **Claims 6-7 and 9-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Jabri et al in view of Chen et al *(U.S. Patent: 6,144,935).*

  With respect to **Claim 6-7**, Jabri discloses the transcoding device that selects weighting

factors with respect to source and destination coders comprising coding means, as applied to

Claim 5. Also, Jabri further discloses:

   Extracting an LPC coefficient by decoding a bitstream encoded in the input CELP codec

format *(generated LP coefficients from a current speech segment, Paragraphs 0033 and 0035-*

0036); and

   Evaluating the perceptual weighting filter to be used in the output CELP codec by using the

LPC coefficient obtained in the previous *step (perceptual weighting equation utilizing LP*

coefficients, Paragraphs 0035-0036; and source encoder comprising a perceptual weighting

filter, Paragraph 0006)).

Although Jabri discloses choosing weighting factors based on source and destination coders, respectively comprising perceptual weighting and perceptual weighting compensation means *(Paragraphs 0005-0006)*, Jabri does not teach selecting weighting factors by combining a compensation or inverse filter and a perceptual weighing filter in series. Chen, however, discloses a tandem encoder/decoder that selects tunable weighting factors, γ_1 and γ_2, based on a product *(i.e., series)* combination of a perceptual weighting filter equation and a long term postfilter that compensates for spectral tilt that results from perceptual weighting *(the factor μ)* *(Col. 5, Lines 10-61)*.

Jabri and Chen are analogous art because they are from a similar field of endeavor in tandem encoders/decoders. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Jabri with the weighting filter calculation technique taught by Chen in order to improve performance of vocoders in a tandem configuration *(Chen, Col. 3, Lines 28-35)*.

Claims 9-10 contain subject matter similar to Claims 6-7, and thus, are rejected for the same reasons.

Allowable Subject Matter

14.   **Claims 11-13** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and rewritten to overcome the above 35 U.S.C. 101 rejections.

15.   The following is a statement of reasons for the indication of allowable subject matter:

With respect to **claim 11**, the prior art of record does not explicitly teach or fairly

suggest, either individually or in combination, a method for selecting transcoding filter weights

in the transcoder defined in claim 8 based on a reference filter generated using the characteristics

of a perceptual weighting filter and post-filter applied to an input CELP codec and a perceptual

weighting filter applied to an output CELP codec, wherein, the step of selecting comprises: (B1)

randomly selecting one weight pair from a weight set; (B2) evaluating the transcoding filter by

applying the selected weight pair to the transcoding filter having a perceptual weighting filter

form; (B3) calculating a frequency response of the transcoding filter evaluated in step (B2); (B4)

calculating a spectral distortion of the transcoding filter by comparing the frequency response of

the reference filter with a frequency response calculated in step (B2); (B5) calculating the

spectral distortion corresponding to each weight pair by performing steps (B2) through (B4) for

every weight pair from the weight set; (B6) selecting a weight pair resulting in a minimum

spectral distortion as the optimum weight pair.

Closest Prior Art:

Although Jabri et al *(U.S. Patent Application Publication: 2004/0158463)* evidences that

it is well known in the prior art to implement a perceptual weighting or transcoder filter in a

transcoding device, design or select weights for such a filter based on source and destination

codecs comprising filtering means *(Paragraphs 0035-0036 and 0041)*, and additionally evaluate

multiple weighting factor pairs to determine which pair results in the least spectral distortion or

highest voice quality *(Paragraphs 0035-0036)*, Jabri does not evaluate the distortion used to

select the perceptual weighting parameter pair in the same manner as that recited in claim 8.

Claim 8 specifies that a distortion is calculated by comparing a frequency response generated by utilizing multiple weight pair sets in the perceptual weighting filter of the transcoder to a frequency response of the reference filter detailed in the previous paragraph. Jabri, on the other hand, discloses that a lowest distortion (i.e., highest voice quality) used to select weighting factors with respect to source and destination codecs is measured in the signal *(Paragraph 0036)* and does not result from a direct comparison between the frequency responses of the reference filter and the perceptual weighting filter operating with specific weighting parameters. Thus, Jabri does not explicitly teach or fairly suggest the invention recited in claim 8. **Claims 12 and 13** contain claim language identical to claim 11, and thus, these claims also contain allowable subject matter for the same reasons.

Conclusion

16.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this

final action.

17.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632.

The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

        Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/James S. Wozniak/
James S. Wozniak
Patent Examiner, Art Unit 2626

/Patrick N. Edouard/
Supervisory Patent Examiner, Art Unit 2626